SMALL COMPUTERS: IMPACT ON SERVICES

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ABOUT INPUT

Formed in 1974, INPUT has rapidly grown to become a leading business consulting company in the information processing industry. It specializes in market research, planning services, and special analyses for users and vendors of computer, and communications, and office products and services.

The company carries out continuous and in-depth research with vendors and users in the industry. Our staff analyze and interpret the complex and voluminous data derived from this research, based on their experience and the needs of clients. This information is presented concisely and understandably through reports and presentations. Useful recommendations and access to back-up data are strong points of our client relations.

INPUT's professional staff have, on average, nearly 20 years experience in the information processing industry. Most have had senior management experience in operations, marketing, or planning roles. This expertise provides INPUT with unique strengths attested to by the company's client base, which includes many of the world's largest companies.

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SMALL BUSINESS COMPUTERS:

THEIR IMPACT ON PROCESSING SERVICES

IMPACT REPORT

NO. 5

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SMALL BUSINESS COMPUTERS:

THEIR IMPACT ON PROCESSING SERVICES

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I. INTRODUCTION

I   INTRODUCTION

● The purpose of this report is to describe and evaluate:

- The trend of processing services users switching to in-house small business computers

- How small business computer manufacturers are targeting processing services users as a marketing opportunity

- What actions processing services vendors are taking to counter the competitive impact of small business computers

- The reasons users acquire small business computers and their decision making procedures

- Technological advancements which will affect future price/performance ratios of small business computers.

● This report is based upon on-site interviews in California, Massachusetts, and the Midwest and upon supplementary telephone interviews.

● Interviews were conducted with:

- 35 users of small business computers

- 8 processing services vendors

- 12 manufacturers and distributors of small business computers.

- This report is produced by INPUT as part of the Market Analysis Service. Inquiries and comments on the information presented in this report are requested from clients.

II. DEFINITIONS

II DEFINITIONS

● Processing Services encompass three modes of service: Facilities Management, Remote Computing Services, and Batch Services.

- Facilities Management (FM) is the management of all or part of a user's data processing functions under a long-term (not less than one year) contract. To qualify, the contractor must directly plan and control, as well as operate, the data processing facility provided to the user on-site through communications lines or in mixed mode. Simply providing resources, even though under a long-term contract and/or for all of a user's processing needs, does not qualify as FM.

- Remote Computer Services (RCS) include general problem solving, interactive use of terminals (time-sharing), use of remote batch devices for remote job entry or remote data entry, and data base services, such as stock quotation and credit systems.

- Batch Services include data processing performed at vendors' sites of user data which has been physically transported (as opposed to electronically by communications lines) to those sites. Data entry and data output services, such as COM processing, are also included.

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- A Small Business Computer, for the purpose of this study, is a system which is built around a proprietary Central Processing Unit (CPU), and which has the ability of utilizing at least 10M bytes of disk capacity, provides multiple CRT work stations, and offers business-oriented system software support.

- A Small Business Computer Manufacturer builds its system around a proprietary CPU and provides systems software. It may make or buy peripheral equipment and semiconductor devices. Distribution to the end user may be through its company field sales offices, a network of distributors, or both.

- Software Products are systems and applications packages which are sold to computer users by equipment manufacturers, independent vendors, and others. They also include fees for work performed by the vendor to implement a package at the user's site.

- A Systems House integrates hardware and software into a total turnkey system to satisfy the data processing requirements of the end user.

- A Distributor purchases the small business computer on an OEM basis from the manufacturer and markets it to the end user. It may or may not provide a turnkey system.

- Peripherals include all input, output, and storage devices, other than main memory, which are locally connected to the main processor and are not generally included in other categories, such as terminals.

● <u>A Turnkey System</u> is composed of hardware and software integrated into a total system designed to completely fulfill the processing requirements of a single application.

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III. EXECUTIVE SUMMARY

III   EXECUTIVE SUMMARY

A.   FINDINGS

1.   THE SMALL BUSINESS COMPUTER USER

●   Most users initially consider switching from processing services

to a small business computer as a result of an experience involving

poor service.

●   Lower "cost" and increased "control" are the recurrent reasons

given by those new small business computer users who defected from

processing services.

      —   "Cost" is usually limited to the monthly processing service

      charges versus the monthly hardware and maintenance costs for the

      in-house system.

      —   Personnel costs are usually absent from the calculation

      because system "operators" are considered to be system "users"

      and additional tasks are being performed without a personnel

      increase.

      —   Software costs are frequently not considered in the cost

      calculation.

- "Control" relates to the user's dissatisfaction with the services vendor's responsiveness to requests for software modifications, format flexibility and processing turnaround time.

● Users do not usually perform a detailed cost comparison prior to purchasing a small business computer.

● Despite the stated user indication that cost is one of the most important decision criteria, the fact that an in-depth cost analysis is not performed indicates that other issues may be considerably more important.

● It takes from 1 to 4 years from the time a user decides to search for a small business computer until the in-house system is installed.

● Standard applications packages are not attractive to small company users. Over 90% of respondents want packages designed or modified to their business peculiarities.

● Except for large mainframe manufacturers, applications software is often not directly provided by the manufacturer. 74% of users interviewed initially contract with the services vendor, or a third party software company, learn all they need to know at the vendor's programming school and thereafter perform program development, program modifications, and software maintenance themselves. By comparison, over 90% of users converting from RCS to a small business computer do some or all of their own programming.

- Users expressed no prejudice against processing services vendors as small business computer suppliers as long as service was acceptable. An advantage observed was that better coordination could be provided during the period of transition from the outside service to the in-house computer system.

- Users generally are experiencing high uptime performance of hardware.

- Users believe that at monthly service levels of $1,000 to $2,000 per month they can get better control, greater flexibility, and more opportunities for growth at less cost by having their own in-house small computer.

- Most small business systems are installed and operating in a few months. It is not difficult to train a clerical staff in their operation.

- Nearly all users are satisfied with both cost and performance of their computer systems after a year or more of use. The few dissatisfied users encountered were unhappy with the vendor's support not with its hardware.

2. THE PROCESSING SERVICES VENDOR

- Larger services vendors catering to larger users are less concerned about competition from small business computers than are smaller

vendors who depend on smaller users spending in the range of $1,000 to $2,000 per month.

- Processing services vendors report that from 0.5% to 12% of a year's lost revenues are lost to small business computer systems purchased by their existing users.

- The threat of small business computer systems is greater with batch and remote batch users than with interactive users.

- Processing services vendors (batch service bureaus) feel the impact of small business computers more strongly in the loss of new business prospects upgrading from manual operations than in the conversion of existing processing services users.

- Processing services vendors generally lack effective systems to monitor customers in order to detect and prevent potential defectors from migrating or to determine the actual level of migration.

- The processing services client most likely to convert to a small business computer:
    - is doing primarily accounting applications
    - has a single specialized application
    - is using outdated software
    - is complaining about poor services.

- Several vendors with a large base of batch-oriented small users

are also distributing small business computers. These include large firms like ADP which offers the Microdata Reality under its own name, and smaller firms like Computer Task Group, Inc. and NLT Computer Corp., which act as distributors for the Basic Four.

● The marketing of a small business computer by a processing services vendor is not related to the size of the vendor or the type of services offered but rather to its management of the attitude about offering a complete range of solution options to its clients and the perception by its management of its vulnerability to small business computer competition.

● The wave of distributed processing has not yet "arrived", despite all the talk about it. More common is the installation of free standing systems to supplement in-house or outside interactive systems capability. IBM will accelerate distributed processing's becoming a reality when it fully implements its own product offerings related to the communications environment.

3. THE SMALL BUSINESS COMPUTER MANUFACTURER

● The small business computer industry, with estimated sales in 1976 exceeding $1.5 billion, is an outgrowth of the billing and accounting machine market established by such firms as Burroughs, NCR, and Friden.

   - The industry is about 7 years old
   - Participants in this industry are approximately 30

manufacturers, each building a system around a proprietary CPU.

    –   Shipments will grow at about 20% to 25% annually.

●   Hardware differentiation is diminishing as companies purchase peripheral equipment on an OEM basis to be incorporated in their systems.

●   As hardware prices drop, manufacturers place more emphasis on software, both systems and applications.

●   There is an increasing trend of small systems and software houses toward providing turnkey installations to the user, while acting as distributors for the manufacturer.

●   European computer systems manufacturers are having more success with their small business computers than with their large computers in the U.S. market.

●   The small business computer manufacturer is prospering at the expense of the processing services vendor.

    –   35% of new business is from batch services defectors.

    –   30% of new business is from first time EDP users who upgraded from a manual system to a small business computer rather than employ batch services.

    –   Remote computing services have been impacted to a lesser degree, but their growth has been retarded by business lost to the small business computer.

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● Respondents report that the average hardware system price is
$50,000 to $55,000 and that at least 95% of their installations are
on either a sale or full payout lease basis.

● 75% of our selected sample report having less than 10% of
installations in a communications environment.

● Product maintenance is offered by the manufacturer or by third
party organizations.

● The following trends in average system hardware are anticipated
for 1976-1980.

- Systems in a communications environment will expand from 3%
to 30%.

- Hardware prices for an average system will drop slightly
(5%) and will provide about 50% more performance.

- Disk drive capacity will almost triple to about 70M bytes.

- A continued gain in the price/performance of small business
computers, which is anticipated to improve by a factor of 1.6
between 1976 and 1980, will result from:

    . Continued decreases in semiconductor main memory costs

    . Continued price/performance improvements in "computer on
    a chip" technology

    . Cabability advancements in computer peripheral products,
    particularly for random access memories and visual display
    work stations

. Accessibility and flexibility, especially when compared to batch services.

● The following trends are developing in the marketing strategies of small business computer manufacturers.

- Larger and more financially stable companies are marketing through their own sales offices to the end user.

- The smaller manufacturers are more likely to utilize systems houses, processing services vendors, and software houses to distribute their product, often on a turnkey basis.

- Many of the smaller manufacturing companies are seeking new distributor outlets for covering specific industries or geographic locations.

- None of the small business computer manufacturers, including IBM, are at present specifically attacking the user of processing services as a target of opportunity.

- In addition to its System/3 and System/32, which are fully supported systems, IBM is offering its Series/1. With Series/1, IBM supplies a list of approved software vendors qualified to perform applications programs; it thereby gives its seal of approval to an industry procedure long followed by other manufacturers.

● As their price/performance and capabilities continue to improve, microprocessors will replace minicomputers at the low end of the small business computer market. This will result in yet lower hardware costs to the user.

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B.   RECOMMENDATIONS FOR PROCESSING SERVICES

●   Processing services vendors should establish a procedure for the
periodic review of customers spending from $1,500 to $2,500 monthly in
order to:

-    Determine customers' satisfaction with the service provided

-    Evaluate whether the charges for services provided are priced
competitively

-    Determine if customers can economically use or are considering
the purchase of a small business computer system.

●   Vendors should take into account that small business computers
appear to be the greatest competitive threat to a services vendor who
has a substantial client base with the following profile:

-    Monthly charges below $2,000

-    No requirement for remote computing services

-    Purchasing primarily general business applications.

●   Vendors should establish a lost business account profile based on
company statistics. Through interview procedures, vendors should
accumulate the following data on lost accounts:

-    The user's monthly billing level for processing services

-    The type of service provided

-    The applications performed

-    The reasons the user gave for cancelling service

-    The length of time the user was a customer

- How the user's data processing is presently being performed and what its future plans are

- The model and manufacturer of the small business computer that the user has or is planning to acquire (if applicable)

- How the account might have been retained

- Other pertinent data.

● Processing services vendors with a customer base which substantially meets the profile described above should consider expanding their product offerings in order to more fully meet the requirements of their present and future customers. They can accomplish this objective by:

- Offering a small business computer or an intelligent terminal as a means of communicating with the RCS host

- Becoming a small business computer manufacturer's appointed distributor for a specific geographic area or industry

- Supplying turnkey industry or specialized accounting-oriented applications packages from existing software, if available, for one or more types of small business computer systems

- Developing more efficient systems software tools for specific computer systems

- Upgrading their processing services customer base so that larger users represent a greater percentage of their total revenues

- Encouraging a larger portion of their customer base to use remote computing services

- Striving to employ company strengths in processing services, hardware, communications, and software to maximize profit through product specialization and individuality.

● If a processing services vendor decides to distribute small business computers on a turnkey basis, it can act as the total supplier of data processing to its customers by:

- Assisting its customers in providing a plan delineating activities and costs for installing a small business computer

- Comparing the costs of installing a small business computer with processing services charges for completing specific data processing tasks

- Selling or leasing to its customers a small business computer system with customized applications software

- Assisting its customers in insuring a smooth transition of those applications to be transferred from processing services to a small business computer and in retaining those applications that are provided more efficiently by services

- Offering to manage and operate its customers' acquired small business computer systems on its own premises, if they are unable to immediately install and operate the systems at their locations.

● Vendors should review their sales commission structures and consider applying penalty charges for lost business accounts. As an alternative procedure, vendors might transfer the responsibility for account control of present customers from their salesmen to non-commissioned local sales office marketing representatives.

- Vendors should review pricing strategies. Specifically, they
should:

    - Consider increasing prices for products that are differen-
    tiated or that are unique in the marketplace

    - Consider lowering prices for mature products that are more
    susceptible to competition.

IV. SURVEY PROFILES

IV SURVEY PROFILES

A. USER PROFILES

● Thirty-five users of small business computers who were interviewed for this project are tabulated in Exhibit IV-1.

- Users' annual revenues ranged from less than $1 million to about $30 million, except for one large manufacturer of telephone components with revenues of $300 million.

- Over 50% of the users surveyed are either in the manufacturing or the distribution business.

● The distribution of small business computer manufacturers selected by users is shown in Exhibit IV-2.

● Of the users surveyed, 34% previously operated manual or accounting machine systems, except in three instances for payroll (Exhibit IV-3).

● 74% of the users (companies or their employees) had no prior experience with in-house computers (Exhibit IV-4). In some cases, employees with prior experience were hired to manage the new installation.

B. PROCESSING SERVICES VENDOR PROFILES

● Eight vendors responded to the survey, as shown in Exhibit IV-5.

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EXHIBIT IV-1

USERS OF SMALL BUSINESS COMPUTERS

INTERVIEWED IN SURVEY

TYPE OF BUSINESS	ANNUAL REVENUES ($ MILLION)	NUMBER OF EMPLOYEES	SMALL BUSINESS COMPUTER INSTALLED
Guard Service	$ --	--	Basic Four
Food Distributor	3	65	DEC PDP 11/45
Wholesale Distributor	8	150(E)	Basic Four 600
Meat Packer	--	--	Basic Four
Property Management	--	16	Wang 2200
Precision Metal Shop	6(E)	150	Gen. Automation
Auto Parts Distributor	2(E)	60	STC/Ultimacc
Radio Parts Retailer	--	--	STC/Ultimacc
Heating Equipment Mfr.	6(E)	150	Basic Timesharing
Telephone Manufacturer	300(E)	10,000	Basic Timesharing
Medical Lab Services	--	8	Basic Timesharing
Import/Export	6(E)	25	Basic Four 400
Book Publisher	--	65	Basic Four 400
Aerospace Manufacturer	15	300	DEC/PDP 11/45
Accountants	3(E)	100	DEC/PDP 8E
Microfilm Manufacturing	30	350	Basic Four 600
Wholesale Crafts	2(E)	70	Logical ADAM

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EXHIBIT IV-1 (contd.)

USERS OF SMALL BUSINESS COMPUTERS

INTERVIEWED IN SURVEY

TYPE OF BUSINESS	ANNUAL REVENUES ($ MILLION)	NUMBER OF EMPLOYEES	SMALL BUSINESS COMPUTER INSTALLED
Steel Distribution	$ 1(E)	37	Logical ADAM
Biomedical & Dental Mfr.	6	150	Basic Four 600
Mailing Service	--	--	Logical ADAM
Import/Export	--	400+	Logical ADAM
Electric Utility	3	55+	Prime 300 & 400
Steel Manufacturing	20	500	IBM S/3 Mod. 15
Manufacturer/Distributor	--	--	STC/Ultimacc
Life Insurance	5	500	IBM 5100
Savings & Loan	--	--	Burroughs 721
Tool Distributor	2(E)	40	Basic Four 600
Book Distributor	5	25	Microdata REALITY
Clothing Manufacturer	--	--	Basic Four 400
Life Insurance	--	1,000	IBM S/3
Health Products Distr.	25	--	IBM S/3 Mod. 10
Bail Bond Insurance	--	20	IBM S/3 Mod. 8
Insurance	--	70	IBM S/32
Hospital	--	--	IBM S/3
Instrument Manufacturer	--	50	IBM S/3

E = INPUT Estimate

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EXHIBIT IV-2

DISTRIBUTION OF USERS' SELECTIONS

OF SMALL BUSINESS COMPUTERS

NUMBER OF RESPONDENTS

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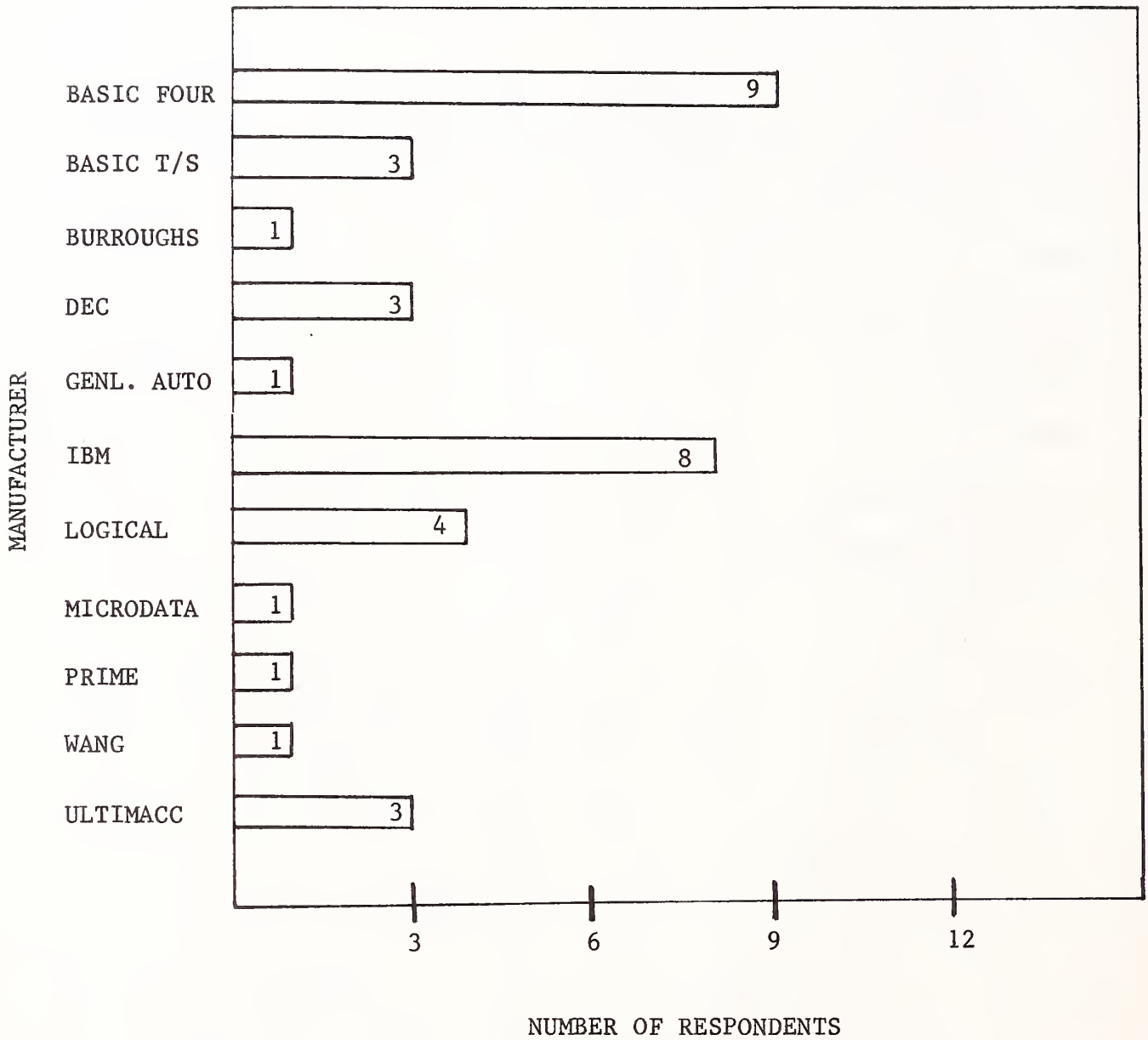
EXHIBIT IV-3

DISTRIBUTION OF USERS' FORMER SYSTEMS
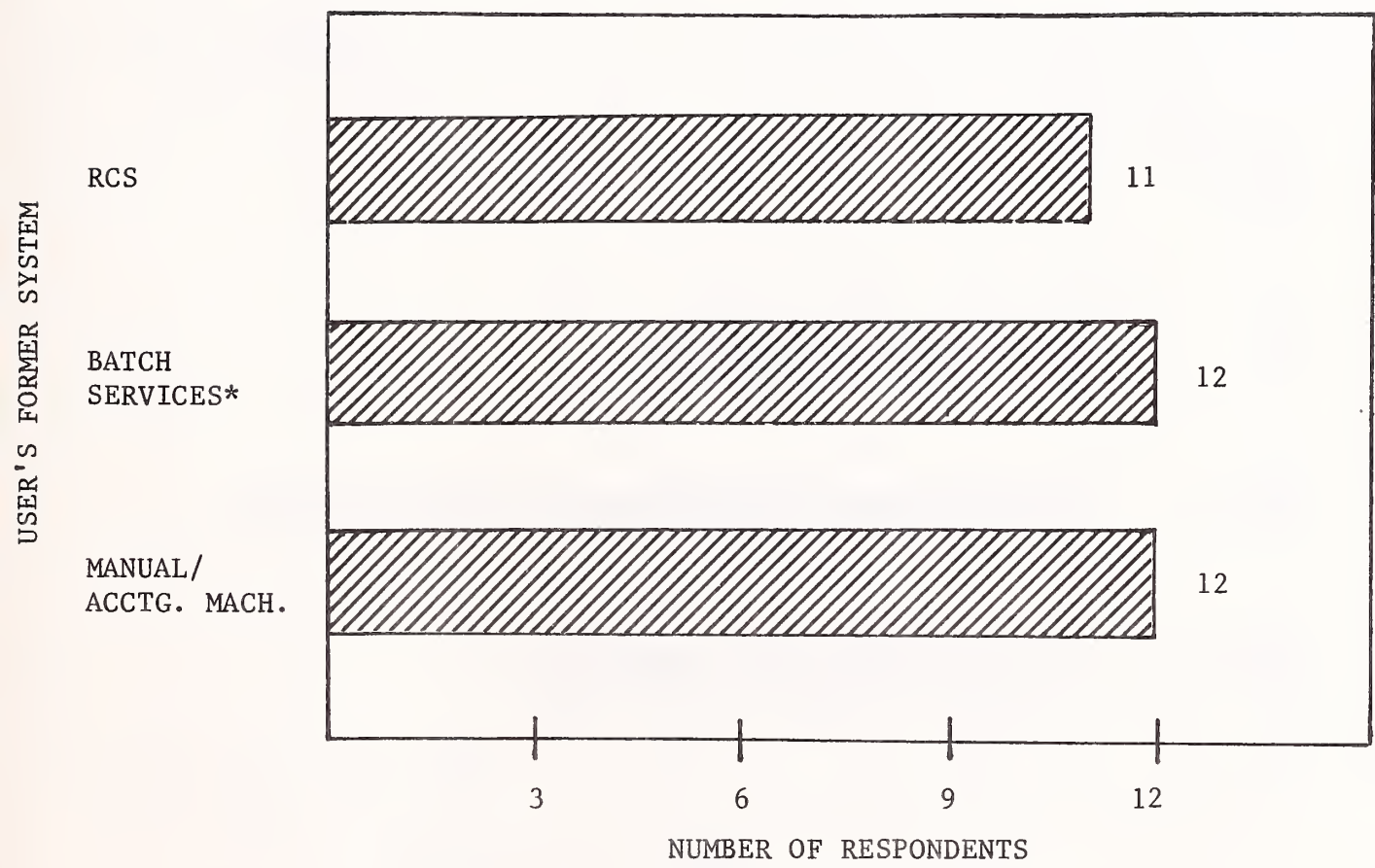
* 3 of the batch services users were manual except for payroll.

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EXHIBIT IV-4

DISTRIBUTION OF COMPANIES' OR THEIR EMPLOYEES'

PRIOR DATA PROCESSING EXPERIENCE

☐ Prior Computer Experience

▨ No Prior Computer Experience

USERS' PRIOR DATA PROCESSING EXPERIENCE

IN-HOUSE BATCH — 1 / Ø

RCS — 5 / 6

BATCH SERVICES — Ø / 12

MANUAL/ ACCTG. MACH. — 3 / 8

3   6   9   12

NUMBER OF RESPONDENTS

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EXHIBIT IV-5

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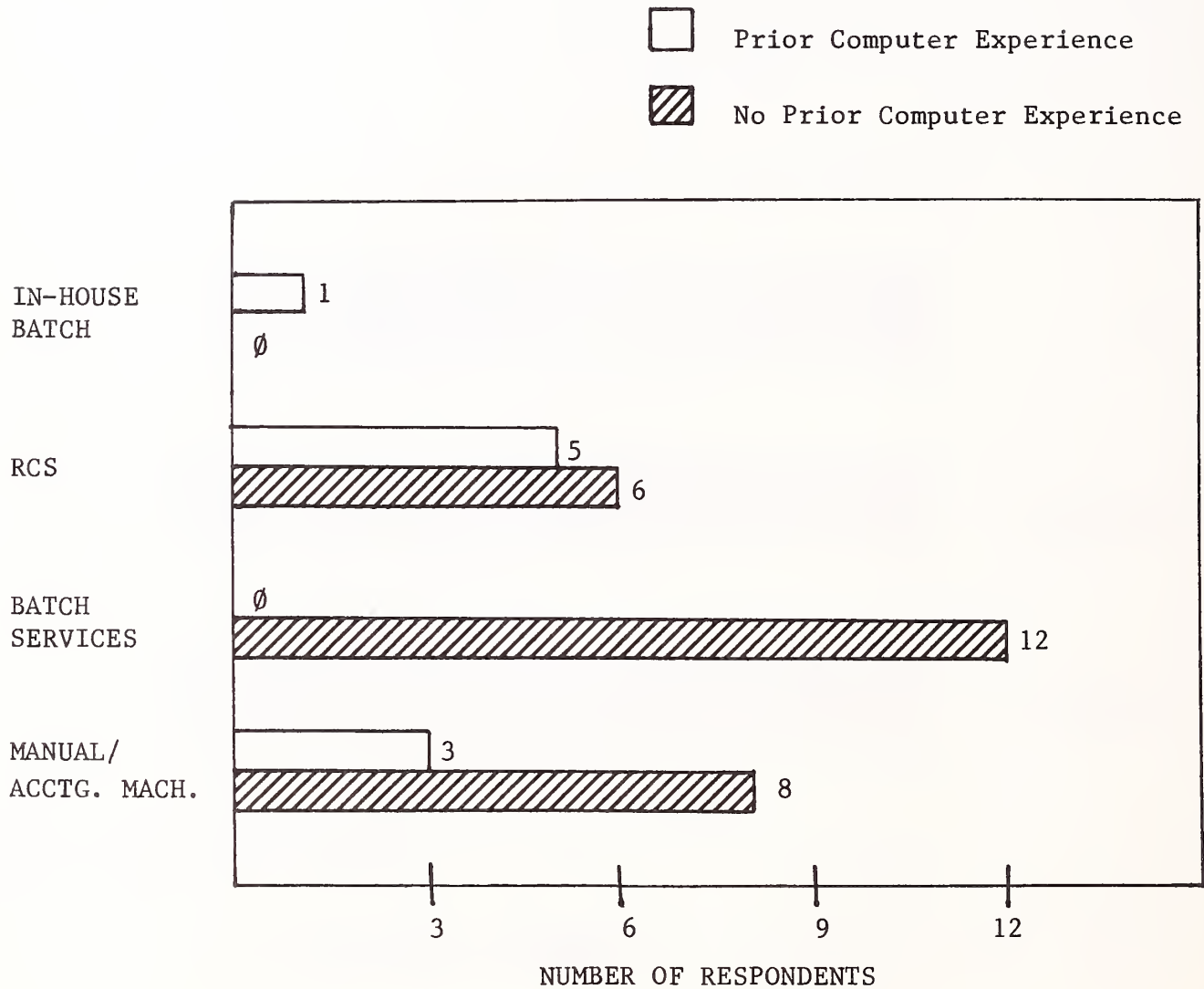
PROCESSING SERVICES VENDORS

RESPONDING TO SURVEY

ANNUAL PROCESSING SERVICES REVENUES ($ MILLION)	MAIN MODE OF SERVICE	LOSING BUSINESS TO SMALL BUSINESS COMPUTERS	MARKETING SMALL BUSINESS COMPUTERS
$15	RCS	Yes	No
85	RCS	Yes	Yes
50	RCS	Not Much	Yes
100	RCS & Batch	Not Much	No
2	Batch	Yes	Yes
3	Batch	Yes	Yes
85	RCS & Batch	Not Much	Yes
25	RCS	Yes	No

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- Revenues of the respondent processing services vendors range from $2 million to $100 million annually.

- Services offered are exclusively batch, exclusively remote computing, or a combination of both.

C. SMALL BUSINESS COMPUTER MANUFACTURER PROFILES

- End users are served by the following manufacturers marketing directly or through agents and distributors:

  - Full line computer companies with vast resources and a complete stable of product lines (i.e., Burroughs, CDC, DEC, Honeywell, IBM, NCR, and Univac.

  - Smaller companies concentrating on a single or far narrower product offering frequently augmented by OEM minicomputer sales (e.g., Basic Four, Basic Timesharing, Computer Automation, Data General, Microdata, Ultimac, and Wang)

  - European manufacturers who are enjoying more success in penetrating the U.S. market with their smaller rather than with their larger systems. (Notably successful are small business computers produced and marketed by Nixdorf, Phillips, and Olivetti.)

- The 30 manufacturers of small business computers built around a proprietary CPU are listed in Exhibit IV-6. They provide a product offering which includes:

  - A full operating system retailing for less than $50,000

  - System internal memory storage of at least 32K bytes

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EXHIBIT IV-6

MANUFACTURERS OF SMALL BUSINESS COMPUTER SYSTEMS

HAVING PROPRIETARY CPUs

MANUFACTURER AND LOCATION	TURNKEY SYSTEMS DISTRIBUTED TO END USERS VIA:	
	COMPANY SALES OFFICES	ESTABLISHED NETWORK OF DISTRIBUTORS, AGENTS, SOFTWARE HOUSES, ETC.
Basic Four, Irvine, CA	Yes	Yes
Basic Timesharing, Sunnyvale, CA	No	Yes
Burroughs, Detroit, MI	Yes	No
Cincinnati Milacron, Lebanon, OH	No	Yes
Computer Automation, Irvine, CA	No	Yes
CDC, Minneapolis, MN	Yes	No
Data General, Southboro, MA	No	Yes
Datapoint, San Antonio, TX	No	Yes
DEC, Maynard, MA	No	Yes
Four Phase, Cupertino, CA	No	Yes
General Automation, Anaheim, CA	No	Yes
Harris, Fort Lauderdale, FL	No	Yes
Hewlett-Packard, Cupertino, CA	No	Yes
Honeywell, Waltham, MA	Yes	Yes

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EXHIBIT IV-6 (contd.)

MANUFACTURERS OF SMALL BUSINESS COMPUTER SYSTEMS

HAVING PROPRIETARY CPUs

MANUFACTURER AND LOCATION	TURNKEY SYSTEMS DISTRIBUTED TO END USER VIA:	
	COMPANY SALES OFFICES	ESTABLISHED NETWORK OF DISTRIBUTORS, AGENTS, SOFTWARE HOUSES, ETC.
IBM, Atlanta, GA	Yes	No
Interdata, Oceanport, NJ	No	Yes
Litton, Pine Brook, NJ	Yes	No
Lockheed, Plainfield, NJ	No	Yes
Logical, Burlingame, CA	No	Yes
Microdata, Irvine, CA	No	Yes
NCR, Dayton, OH	Yes	No
Nixdorf, Chicago, IL	Yes	No
Olivetti, New York, NY	Yes	No
Phillips, Woodbury, NY	Yes	Yes
Prime, Framingham, MA	Yes	Yes
Qantel, Hayward, CA	No	Yes
Raytheon, Norwood, MA	Yes	No
STC (Ultimacc), Paramus, NJ	Yes	No
Univac, Blue Bell, PA	Yes	No
Wang, Tewksbury, MA	Yes	No

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- Disk storage of at least 20M bytes

- A 200 line/minute printer (minimum)

- Basic systems software (compilers, assemblers, etc.)

• From the group of 30 manufacturers, 12 were interviewed (Exhibit IV-7).

• A selected sample of eight companies was chosen from all the interviewees. Requirements for inclusion in the sample were:

- That a substantial number of a company's new customers were processing services "defectors" (Exhibit IV-8)

- That a company had a single product line or a clearly defined and separate small business computer line.

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EXHIBIT IV-7

SMALL BUSINESS COMPUTER MANUFACTURERS

RESEARCH TABULATION

CATEGORY	INTERVIEWEES	SAMPLE
Interviews Attempted	17	
Interviews Declined	5	
Companies Interviewed	12	
Selected Sample Established		8
Major Full Line Computer Companies	3	1
Companies Concentrating on a Single Product Line: Offering Turnkey Systems Through Their Own Or Distributor Marketing Outlets	9	7
TOTAL	12	8

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EXHIBIT IV-8

SMALL BUSINESS COMPUTER MANUFACTURERS

PROFILE OF THEIR NEW CUSTOMERS

ESTIMATED 1976 SALES OF SMALL BUSINESS COMPUTERS IN USA ($ MILLION)	MANUAL	RCS	BATCH	LARGE CPU	ACCTG. MACH.
$ 2	50%	5%	30%	5%	10%
5	15	5	55	10	15
35	44	0	14	1	41
60	**	**	**	**	**
200	15	5	50	25	5
13	5	**	**	**	**
20	10	50	10	20	10
65	50	5	35	5	5
2	0	0	0	95	5
32	**	**	**	85	5
150	65	5	25	5	0
	10	10	50	15	15

** Not Available

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V. RESULTS OF THE SURVEY –
ANALYSIS OF SMALL
BUSINESS COMPUTER
USERS

V   RESULTS OF THE SURVEY - ANALYSIS OF SMALL BUSINESS COMPUTER USERS

A.   THE DECISION PROCESS

1.   LOWER "COST" AND INCREASED "CONTROL" - MAJOR USER CONCERNS

●   Users who switched from outside services to small in-house systems
indicate that lower "cost" and increased "control" were their major
reasons. These reasons are given with equal frequency. When "cost" and
"control" are probed in depth, the following user definitions emerge:

-    "Cost differential" is perceived as the monthly process

services vendor charge as compared to the monthly bank finance

charge plus the monthly maintenance cost for the small business

computer. The personnel cost for operating and programming the

system and the amortized cost of the software development are

notably absent from the calculation.

-    "Control" relates to the user's dissatisfaction with the

responsiveness of the vendor to software modifications, format

flexibility, and processing turn-around requirements.

2.   PERSONNEL: SYSTEM "OPERATORS" AS SYSTEM "USERS

●   Personnel costs are not considered because system "operators" are

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seen as system "users". The computer is seen as a tool which allows the same number of clerical personnel to do more work, thus permitting the firm to grow without adding staff.

● Professional EDP personnel are rarely added. The office manager or administrator usually attends a short course in programming given by the hardware vendor and then is able to maintain, modify, and add to programs as required. Basic Four users are especially vocal on the ease of programming their machines.

3. PROCESSING SERVICES AS PERCEIVED BY THE USER

● Services vendors were often considered to be rigid in input-output requirements, disinterested in making changes, and not sufficiently concerned about delays in processing the user's work.

● If their vendors were willing to make program changes, the cost of their changes were often considered exorbitant.

4. FIRST TIME USER EXPERIENCES

● Respondent first time EDP users who have manual posting or accounting machine backgrounds indicate that they related more favorably to the proposals submitted by small business computer manufacturers than to those by processing services vendors.

● In many cases, users were influenced by "horror stories" they had read or heard concerning services (e.g., little flexibility in form layouts, slow responses, unreasonable rate increases).

5.   THE EMOTIONAL ISSUE

● There is clearly an emotional investment in owning one's own computer. This weighs heavily in the decision process and contributes to the potential user's minimizing of comparative detailed financial analysis.

● Such "pride of ownership" can be compared to early reactions of executives of the larger corporations toward their first computers.

6.   THE FINANCIAL ANALYSIS PROCEDURE

● When asked if a financial analysis was completed comparing the costs of an in-house small business computer versus a processing service, almost one-third of the respondents reported that no analysis was performed (Exhibit V-1).

● Twelve respondents were certain that a financial analysis had been done beforehand.

  - Eight considered the cost of hardware and maintenance only.

  - Four did a follow-up audit. Half were satisfied, half were not. Of the two dissatisfied, one said the system was discontinued and a service bureau reinstated but the other merely complained that paper costs were much higher than expected.

  - Of the 23 users who did not perform or did not know if they had a financial analysis, all but 2 are satisfied with their decision. The 2 have discontinued the use of their systems due to performance inadequacies.

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EXHIBIT V-1

THE FINANCIAL ANALYSIS PROCEDURE

IF A FINANCIAL ANALYSIS WAS PERFORMED PRIOR TO ACQUIRING A SMALL BUSINESS COMPUTER, WHAT FACTORS WERE CONSIDERED?	NUMBER OF RESPONSES	WAS A POST-AUDIT OF THE FINANCIAL ANALYSIS COMPLETED? NUMBER OF RESPONSES		
		YES	NO	DON'T KNOW
Hardware & Maintenance	8	2	5	1
Hardware, Software & Maintenance	1	∅	∅	1
Hardware, Software, Maintenance & Personnel	3	2	1	∅
No Analysis Performed	11	∅		2
Don't Know If Performed	12	2	∅	13
TOTALS	35	6	15	14

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- When asked how much of a price differential would have induced them to change from a service to a small business computer, most respondents indicated they did not know or that it was irrelevant because their services had been unsatisfactoy. Of those who did offer a range:

    - 1 indicated 40%-50%

    - 6 indicated 25%-40%

    - 2 indicated 10%-25%

    - 1 indicated 0-10%

    - 2 indicated they would be willing to pay more for their systems because of their dissatisfaction.

7. DECISION CYCLE TIME

- Users were rather vague about the amount of time spent (on and off or continuously) from the time the thought of an in-house system was conceived until the beginning of evaluation of available systems. One to three years were typical responses.

- However, as can be seen in Exhibit V-2, things moved quickly once evaluation had begun. The Median times were 7.5 months for evaluation and 3 months for installation completion.

    - Evaluation times ranged from 2 months to 3 years.

    - Installation completion times ranged from 12 days to 13 months. The longest installation times were for two IBM S/3s, an IBM S/32, a Burroughs B721, and a DEC/PDP 11/45. All others took less than 6 weeks.

EXHIBIT V-2

DECISION CYCLE TIME

PERIOD	MONTHS		
	Minimum	Median	Maximum
Evaluation Start to Decision	2	7.5	36
Decision to Installation Completion	0.4	3	13

INPUT

B.   USER EXPECTATIONS

1.   "COST" AS THE USER SEES IT

●   Users are generally unaware of the total actual cost of operating their small business computer systems.

●   In most cases, they are now indifferent because they feel they are getting their money's worth - more work done without additional labor.

●   The person programming is generally doing it as a task added to his basic job but enjoys the work and feels it has reduced his overall workload.

●   Although "cost" is usually given as one of two main reasons for getting an in-house system, the real reasons are not always tangible,

2.   THE MAIN REASONS FOR A CHANGE FROM AN OUTSIDE SERVICE

●   In response to the question "What is your main reason for a change from an outside service?", users gave such answers as:

-   "More bang for the buck."

-   "Service bureau arbitrarily raised charges every month."

-   "Turnaround time too long."

-   "Economic-financial analysis showed in-house system to be cheaper."

-   "Too much downtime, reliability not good."

-   "Desire to provide computer service to our own clients."

INPUT

- "Control over sensitive and private information."

- "Ego trip."

- "After 5 years the service lost interest in us as a client."

- "Wanted programs which were not available."

- "Needed faster response time in order to grow."

- "Our 2 major competitors have this system."

● Users were asked to rate 10 factors relating to their decisions to change from a service to a small business computer. The results are shown in Exhibit V-3.

- Those factors rated most important by more than half of the 16 respondents are:

  . Reliability

  . Cost

- Those factors rated lease important by more than half of the 16 respondents are the availability of:

  . Leases

  . Rentals

  . Networks

  . Applications programs.

● These tabulated data match well with the interview discussions.

- Leases and rentals are unimportant because systems are usually purchased with bank financing.

- Networks are unimportant because most users are coming off manual or batch systems and have geographic limitations.

EXHIBIT V-3

INPUT

IMPORTANCE OF FACTORS IN CHANGING FROM A SERVICE

TO A SMALL BUSINESS COMPUTER

FACTOR	USERS' RATING OR FACTOR (1=unimportant 10=critical)		
	1 - 3	4 - 7	8 - 10
Reliability of System	0	2	14
Applications Programs Availability	10	3	3
Network Availability	13	2	1
Compiler Availability	5	3	8
Assembler Availability	7	4	5
Operating System Availability	3	7	6
Offering of Turnkey	8	4	4
Rentals (30 Days)	12	2	2
Leases (1, 2, 3 Years)	12	3	1
Cost Per Period Comparison	2	4	10

INPUT

- Packaged applications programs are unimportant because most users expect to develop their own, pay someone to do custom programming, or modify a package for their own use.

● When asked about communications requirements, most users said they had none. Those who did indicated requirements for:

- "Dial-up phone and 300 baud line"

- "Private telephone line to warehouse"

- "Dial-up phone"

- "Dial-up phone, 4800 baud line, and time division multiplex"

- "Capability to connect to McAuto via an in-house 370/115"

- "Setting up to use GE network line to New York office"

- "Setting up a data-link to Massachusetts facility"

- "Dial-up phone and 9600 baud line."

● Users did not discuss their decisions to go in-house with their services vendors until they were required to give legal notice of contract termination. Thus, the service vendor was not called upon to help in the decision process or with possible conversion economies. The main reason given is the essentially unsympathetic relationship between user and vendor at the time of decision.

3. APPLICATIONS SOFTWARE

● Implementing an accounts receivable (A/R) application is most often mentioned by respondents as the single motivating force for installing a small business computer. As shown in Exhibit V-4, 80% of the respondents use A/R applications.

EXHIBIT V-4

GENERAL BUSINESS APPLICATIONS IN USE

ON SMALL BUSINESS COMPUTERS

(IN MORE THAN 10% OF THE INSTALLATION SAMPLE)

- 41 -

INPUT
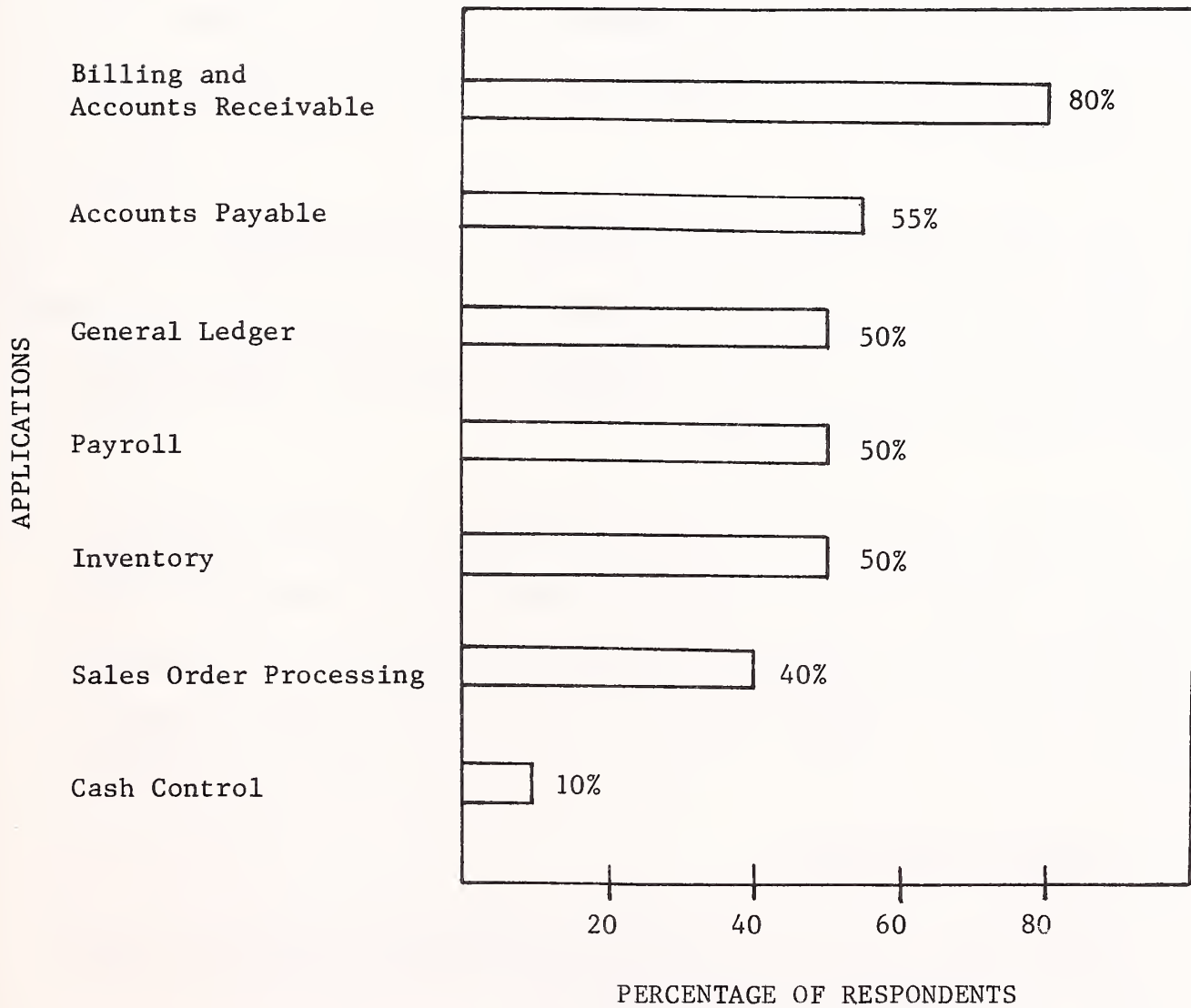
- Small business computer manufacturers often do not supply applications software, so users will frequently engage a systems house or a software service company to develop their initial set of programs. Regardless of whether a software package is provided, users usually go to a short (3 days to 1 week) programming school and learn to program the machine themselves.

  - Sixty-three percent are now doing their own programming entirely, as shown in Exhibit V-5. (Only two hired programmers, the remainder learned how to do the job themselves or contracted outside.)
  - Basic Four has been particularly praised for its ease of programming.

- The cost of providing initial software, which may range up to $75,000, is usually neglected in the user's cost analysis as is the time expended by the user in going to programming school and doing the software development and maintenance.

- Some small systems houses are developing and offering standard business packages for the more popular small business computers. This will further reduce the cost of ownership if users will give up some of their "pride of ownership" in favor of cost savings standardization.

4. HARDWARE MAINTENANCE

- Users usually contract for maintenance with their hardware vendor or with third party service organizations.

EXHIBIT V-5

SOURCE OF APPLICATIONS PROGRAMMING

SUBSEQUENT TO INITIAL INSTALLATION

SOURCE OF PROGRAMMING

USER — 63%

SOFTWARE HOUSE — 17%

IN-HOUSE PLUS OUTSIDE SERVICE — 11%

NO CURRENT REQUIREMENT — 6%

COMPUTER SUPPLIER — 3%

PERCENTAGE OF RESPONDENTS

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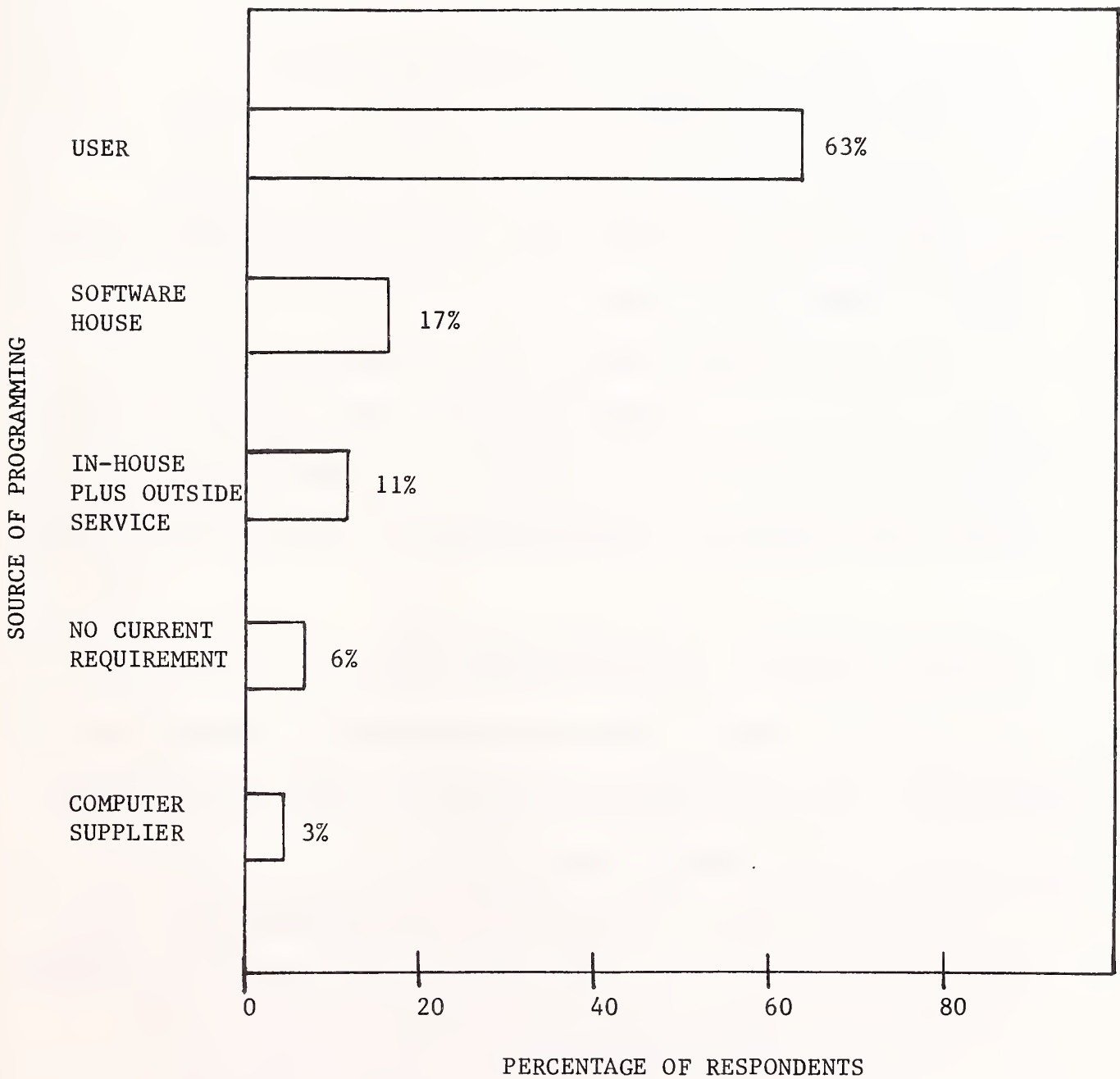
- Those users with in-house maintenance capabilities and high confidence in their equipment do their own maintenance and pay for service calls as required on a time and materials basis.

- One client of Basic Timesharing, Inc. claims to have replaced a CPU himself. BTI mailed the replacement CPU and coached him by phone.

- Users have high expectations of equipment performance.

  - Few failures have been reported for the past 12 months.

  - Downtime is typically limited to preventive maintenance.

  - Virtually all the failures occur during the period just following installation and are mostly electomechanical.

  - One hardware vendor seemed to be having particular difficulty with performance of equipment, mainly the electromechanical devices surrounding its CPU. Three out of five of the vendor's users interviewed were displeased. They were amoung its earliest installations.

5. HARDWARE INVESTMENT - A LONG-TERM COMMITMENT

- Users generally expect to tie system expansion to business growth and anticipate eventually adding CRTs and disks or upgrading to the next larger system in their hardware vendor's line.

  - In two cases, distribution firms were planning to enter the service bureau business to serve others in their industry by offering the specialized software they had developed for their own use.

6. HOW PROCESSING SERVICES VENDORS CAN DO A BETTER JOB

- Comments made by users regarding what services vendors might do to retain clients who are considering in-house systems emphasize client support. Cost is not a driving factor. Responses include:

    - "Have competent programming support."

    - "Understand the client's business better."

    - "Have greater flexibility."

    - "Stress the extra power and capability available when a terminal is used with RCS compared to an in-house computer."

    - "Keep track of former clients who have had small business computer installation failures and refer potential defectors to them."

    - "Educate users on potential software problems."

    - "Keep the client feeling important."

    - "Encourage the development of user group or user library (like that of the Service Bureau Company) to share experiences and software."

- As a significant number of users indicated, there is no way for services vendors, particularly batch service bureaus, to compete at the low end of the business. It simply is cheaper to have an in-house system.

- Users would not object to acquiring a small business computer from a service vendor who was giving good service. In fact, they see definite advantages if:

    - The vendor has been providing good service.

    - The vendor understands the client's business.

    - The vendor's software is compatible with a mini.

INPUT

• That users didn't discuss their intent to switch with their services
vendor indicates not only that they were unhappy with the service but
also that the services vendors marketing representatives were seen as
"salesmen" rather than "problem solvers". This issue needs to be explored
in greater depth by each of the affected vendors.

VI. RESULTS OF THE SURVEY –
ANALYSIS OF PROCESSING
SERVICES VENDORS

VI   RESULTS OF THE SURVEY - ANALYSIS OF PROCESSING SERVICES VENDORS

A.   LOSING BUSINESS TO THE SMALL BUSINESS COMPUTER

● In most cases, processing services vendors interviewed were unable or unwilling to provide "company confidential" information on clients lost to small business computers.

● Through indirect questioning, it was determined that roughly 50% of lost business reported by repondents was from clients spending $2,500 or less per month.

- The 50% threshold level of lost business is expected to drop quickly as the price of small business computers and software falls. Vendors anticipate that within two years the level will have reached clients spending $1,000 or less per month.

- Clients are defecting to small business computers mainly for the performance of routine accounting tasks.

● "Cost" and "control" are given as the main reasons for business lost to small in-house systems. Vendor comments include:

- "The client wants to have the system in-house and to control the processing."

- "Minis give more for the dollar. A client can be on-line at a very reasonable cost."

- "You can't do everything on a small business computer, but what you can do costs an average 25% less than using RCS to a big machine."

● Vendors generally agree that an expectation of saving 25% to 30% would be significant enough for and existing client to go in-house with a small business computer.

● Vendors feel that equal cost is sufficient cause for prospective clients to go in-house, control being the decisive issue.

● Among vendors with larger clients, the impact of small business systems is reported to be slight. Lost business is primarily a result of clients transferring applications to larger in-house machines.

● Three of the vendors interviewed believe that their businesses are impacted only slightly by the competition from small business computers. One of these indicated that its market is limited to Fortune 1000 firms.

B.   IDENTIFYING THE POTENTIAL DEFECTOR

● Large services vendors are apparently not organized to identify potential defectors to small business computers. In this they feel justified because actual defectors represent less than 10% of their total annual losses.

● Smaller services vendors regard all clients spending under $2,000 per month as potential defectors, particularly those who use batch processing for business applications.

- There are two general types of defectors:

  - The small business with primarily accounting-related needs.

  - The small business with a single specialized application.

- Characteristics of high risk potential defectors include:

  - Clients who complain of poor service

  - Clients who use RCS for work which could be done more effectively in a batch mode

  - Clients who use outdated (10 years old) software to whom more efficient software is available

  - Clients who spend in excess of the monthly cost of a three year lease on a small business computer, associated software and hardware maintenance

  - Clients who hire a DP manager or programmer.

C. MEETING THE THREAT

- Responses of services vendors to the small business computer threat have depended on how seriously vendors have taken that threat.

  - Most larger time-sharing firms have virtually ignored it.

  - Some smaller firms, mainly in batch processing, have established special organizations to market hardware systems.

  - One large vendor has attempted, unsuccessfully, to be more competitive by offering time-sharing on an on-line minicomputer as an alternative to its "big machine" service.

  - Another vendor is considering a price reduction for its service.

- Two large vendors regard small business computers as an adjunct to their network services. Clients in remote areas who object to the cost of their large systems communications can use their small systems as remote terminals when greater computational storage is required. By making software available which is upward compatible, these vendors retain clients as part-time large system services users and also operate as systems software suppliers.

- ADP, a $138 million batch-oriented services vendor, is one large vendor which has met the competitive threat. It offers batch services, remote computing services, and small business computer systems to meet a variety of client needs.

    - In 1975, ADP acquired Cyphernetics, then a $16 million RCS vendor. Subsequently, ADP began marketing the Microdata Reality system under its own name. ADP-Cyphernetics revenues of $155 million in 1975 increased to $188 million in 1976, a growth rate of 21%.

    - ADP has over 100 small business computer installations. By contrast, two other large vendors, who are less committed to the marketing of small business computers, together have fewer than 20 installations.

- NCR, a large vendor oriented to the retail industry, markets hardware and services through separate organizations. The services organization does not offer small business systems, but close liaison is maintained between services and hardware personnel in local sales offices.

- Keydata, a time-sharing services vendor, does not market small business computers but offers the "System 800" which, for $800 per month, provides its clients with a set of financially oriented reports.

- Smaller batch vendors, typified by Computer Task Group and NLT Computer Corp., have set up separate marketing organizations which sell Basic Four systems.

  - Because each vendor has two competing product lines, each has attempted to strike a balance which retains existing clients on batch processing and offers the small business computer primarily to new clients.

  - Success has been modest. Both firms together installed only ten Basic Four systems in 1976.

- Smaller services vendors tend to provide turnkey installations and software packages developed by either system manufacturers or affiliated software/systems houses.

- Smaller vendors tend to offer only one line of small business computer systems. Larger vendors tend to provide clients with selection from a full line of products tailored to clients' specific requirements.

- Respondents indicate that they have less of a specific industry than a business applications orientation. One small services vendor who markets small business computers installed five turnkey systems with the following customers (each having annual revenues from $500,000 to $10 million):

- 1 printing company

- 1 religious school

- 1 mobile home parts supplier

- 1 cemetery

- 1 warehouse.

● Facilities management (FM) contracts were not encountered in this study.

- Small business computer users generally comprise the "EDP staff" in small companies.

- A competent EDP staff for large computers already exists in larger companies.

D.   SERVICING THE HARDWARE CUSTOMER

● Services vendor products are usually maintained by hardware manufacturers or third parties.

- Services vendors generally do not perform hardware maintenance on installed systems.

- Vendors consider maintenance availability to be a critical issue in a user's selection of a hardware supplier.

● Small business computer systems marketed by processing services vendors are on a purchase or full payout lease basis.

VII. RESULTS OF THE SURVEY –
ANALYSIS OF SMALL
BUSINESS COMPUTER
MANUFACTURERS

VII RESULTS OF THE SURVEY - ANALYSIS OF SMALL BUSINESS COMPUTER MANUFACTURERS

A. CHANGING TRENDS

1. MANUFACTURERS AND THEIR PRODUCTS

● Because the major computer companies were not meeting the requirements of the small business computer segment of the data processing market, there emerged in the 1969-1970 period many small hardware, software, and systems installation companies dedicated to this market segment.

- The market pioneers were the 1969-1970 start-up companies who made a total effort to penetrate the small business computer market.

- Among the major mainframe manufacturers, Burroughs and NCR were the early market entries, following up their traditional electromechanical billing and accounting machine product offerings.

- IBM, Honeywell, and Univac introduced products only later when a more clearly defined market emerged and the threat to their installed rental bases became apparent.

- 53 -

- The classic minicomputer manufacturers (e.g., DEC, DG, Micro-
data) were also late arrivals, stirred into action by the success
of their OEM customers selling to the small business computer
end users.

● The small business computer manufacturer may be a multi-billion
dollar full line computer company or a small single product line firm
with annual sales of a few million dollars. A company of either size
may supply anything from OEM hardware components to a turnkey system
complete with customized applications software.

2. SMALL BUSINESS COMPUTERS AS A SALES GROWTH OPPORTUNITY

● The small business computer segment is growing at a faster rate
than the computer market as a whole.

● Major full line computer companies have identified this market as
a target opportunity.
- The base of new users offers a source of continuing sales
growth to mainframe manufacturers.
- The full impact of distributed processing has not yet been
felt, so recent product entries can still compete for a share of
that market.

● The only effective way a major full line mainframe manufacturer
can protect its rental base is to offer a "one stop shopping" opportun-
ity to the user, i.e., a full spectrum of products including intelligent
terminals, small computers, and communications processors.

- 54 -

3. LESS HARDWARE DIFFERENTIATION

● Manufacturers, though each employing a proprietary CPU as the
heart of a system, usually purchase or use the same or similar com-
ponents and peripheral equipment (e.g., semiconductors, microcomputer
chips, disk drives, printers).

● Although larger manufacturers usually have better economies of
scale and therefore enjoy more added value in their products, the
performance specifications of various manufactured products tend to
differ little from one supplier to the next.

4. A REDIRECTION OF EMPHASIS FROM HARDWARE TO SOFTWARE

● As hardware differentiation decreases and hardware price/performance
improves, manufacturers are concentrating more on software, which is
becoming an increasingly larger component of total product cost.

● An anticipated shortage of installation programming personnel
in a growing small business computer market will produce the following
results:

    - An increase in customer programming

    - An improvement in software tools

    - An increase in availability of standard applications packages.

5. THE SYSTEMS/SOFTWARE HOUSE FUNCTION

● The small business computer hardware produced by the 30 manufactuers
included in our survey is being distributed as turnkey systems by scores
of service bureaus and systems or software houses.

INPUT

• As the major mainframe computer systems manufacturers become more dominant in the small business computer market, the role of small independent distributors of turnkey systems will change. These distributors will:

- Be squeezed by major manufacturers providing their own turnkey operations

- Become even more specialized and offer more complete industry-oriented applications packages

- Become more closely associated with fewer and larger users requiring installation assistance

- Be consolidated through mergers and acquisitions or go out of business.

B.   THE DISTRIBUTION OF SMALL BUSINESS COMPUTERS
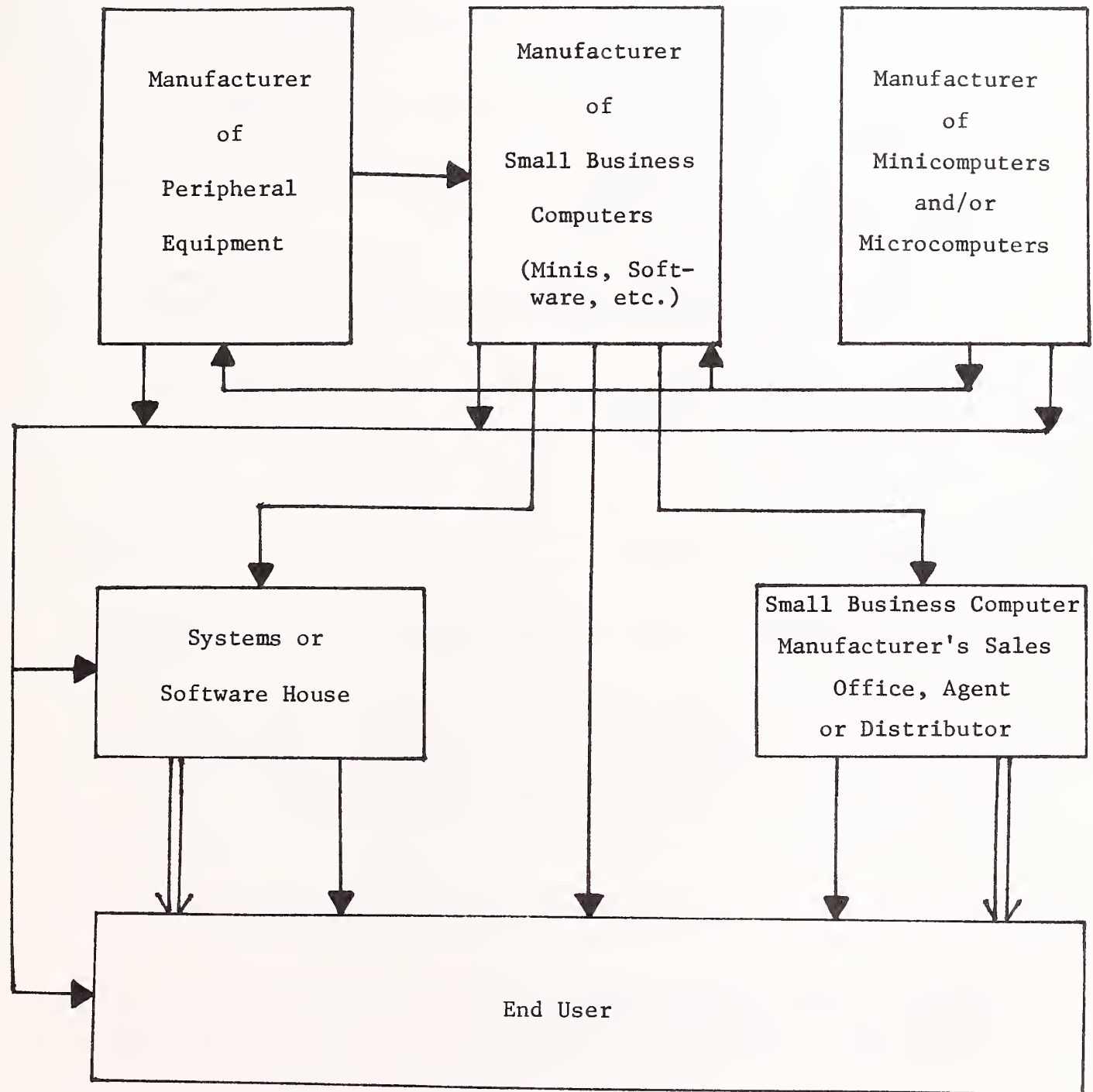

1.   MARKETING TO END USERS

• End users have the option of purchasing small business computers either on a turnkey or an OEM basis; they can even purchase the elements separately and construct their own systems. (See Exhibit VII-1.)

- Turnkey systems are marketed to the end user via the manu-facturer's sales distribution network or through a systems or software house.

- Some large manufacturers provide the purchaser with hardware and systems software but no applications software (e.g., DEC, Hewlett-Packard, Microdata). Such companies usually started with

INPUT

EXHIBIT VII-1

DISTRIBUTION METHODS FOR SMALL BUSINESS COMPUTERS

```
┌──────────────┐      ┌──────────────┐      ┌──────────────┐
│ Manufacturer │      │ Manufacturer │      │ Manufacturer │
│              │      │              │      │              │
│     of       │──────▶│     of       │      │     of       │
│              │      │ Small Business│      │ Minicomputers│
│  Peripheral  │      │  Computers    │      │   and/or     │
│              │      │              │      │ Microcomputers│
│  Equipment   │      │ (Minis, Soft-│      │              │
│              │      │  ware, etc.) │      │              │
└──────────────┘      └──────────────┘      └──────────────┘
```

```
┌──────────────┐                          ┌──────────────────────┐
│              │                          │ Small Business Computer│
│  Systems or  │                          │ Manufacturer's Sales   │
│              │                          │   Office, Agent        │
│ Software House│                          │   or Distributor       │
└──────────────┘                          └──────────────────────┘
```

```
┌────────────────────────────────────────────────────────────┐
│                        End User                              │
└────────────────────────────────────────────────────────────┘
```

─────────────────── = OEM Sales

═══════════════════ = Turnkey Sales

- 57 -

INPUT

the sale of minicomputers on an OEM basis and subsequently expanded into the small business computer marketplace.

- Other major companies have traditionally furnished the end user with a turnkey system complete with applications packages (e.g., IBM, NCR, Burroughs).

- With the growth of the market and the constant improvement of programming tools and capable systems houses, the role of the manufacturer is now less clearly defined.

- IBM, for example, does not supply applications packages with its recently announced Series/1. Systems houses (or end users) purchase hardware subsystems and marry them with software applications packages to provide a total turnkey system.

2. MICROCOMPUTERS AS SYSTEMS

● Microcomputer manufacturers are building small business systems around their "computer on a chip" and marketing their product through similar distribution channels to users who undertake less complicated business tasks or who require less random access storage.

3. PERIPHERAL EQUIPMENT MANUFACTURERS AS POTENTIAL COMPETITORS

● Most of a small business system's manufacturing costs are associated with its peripheral equipment, which usually involves such electomechanical elements as:

- Data entry devices: e.g., keyboards, tape, card, and OCR readers

-	Data storage devices: e.g., magnetic disks, tape drives, and drums

-	Data output devices: e.g., printers, CRTs.

●	The increased utilization of microcomputer chips is constantly adding to the peripherals' capabilities. Peripheral manufacturers such as Pertec and Diablo have already entered the small business computer systems market and others may follow.

## C.   A SELECTED SAMPLE OF SMALL BUSINESS COMPUTER MANUFACTURERS

1.   NEW CUSTOMERS

●	The eight manufacturers selected as a sample provided the following information on their new customers:

-	Fifty percent of new customers formerly used either remote computing or batch services (Exhibit VII-2).

-	Sixty-five percent of new customers never had a computer system or terminal located at their place of business. Thirty percent had been on manual systems, and 35% on batch services.

2.   HARDWARE AVAILABLE

●	Hardware offerings provide little differentiation. They include a modular systems architecture with:

-	128K byte (maximum) internal storage capacity

-	500K to 1200M byte capacity disk/diskette storage

EXHIBIT VII-2

DISTRIBUTION OF RESPONDENTS' NEW CUSTOMERS BY

FORMER DATA PROCESSING METHOD

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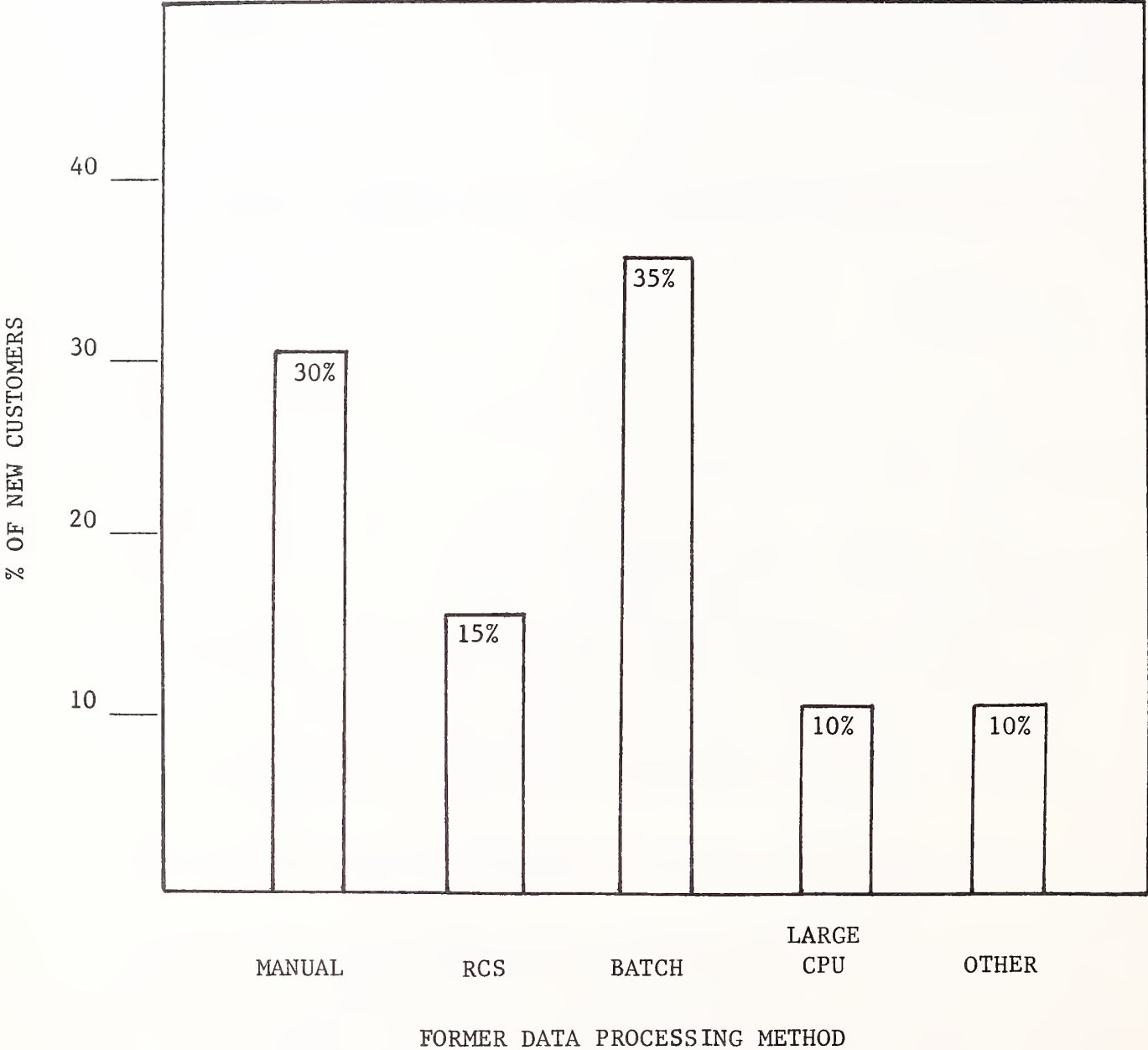
- 32 CRT work station (maximum) capacity

- 50 characters/second to 600 lines/minute printer capacity.

3. SOFTWARE AVAILABLE

● Software support available included, in all cases, a BASIC compiler. Some manufacturers offered COBOL, RPG, and assemblers as well.

4. COMMUNICATIONS CAPABILITIES

● Communications capabilities are generally both synchronous and asynchronous from 1200 to 9600 bauds.

● Companies with less than 10% of their installed base operating in a communications environment do not support IBM protocols.

● The remaining companies do support some portion of IBM 2780/3780 and 2741/3741 protocols.

D. A PROFILE OF THE PRODUCT OFFERED

1. HARDWARE PRICES

● Hardware prices charged by our selected sample range from $20,000 to $100,000 with an average of $53,000.

INPUT

2. LEASE VS. PURCHASE

● Respondents report that 95% to 100% of all systems installed are on either a sale or full payout lease basis. IBM is a possible exception, since it aggressively markets 1 to 3 year leases for its System/32 and System/3.

3. THE IMPORTANCE OF COMMUNICATIONS TODAY

● Seventy-five percent of the respondents report having less than 10% of their machine installations in a communications environment.

4. APPLICATIONS PROGRAMMING

● Applications programming to meet customers' specifications is furnished by the following methods:

- A turnkey system (hardware plus applications software) is provided by the manufacturer.

- Hardware is purchased from the manufacturer, and the applications programming is completed by a systems or software house or by the user.

- A turnkey system (hardware plus specially packaged applications software) is provided by a systems house which purchases hardware from the manufacturer on an OEM basis.

5. PRODUCT MAINTENANCE

● Product maintenance and service contracts are offered, and usual-
ly supplied, by the manufacturer. Ther user's alternatives include
a third party maintenance organization or a time-and-material agreement
with the manufacturer.

E. PRODUCT AND PRICING TRENDS: 1976-1980

1. OVERVIEW OF TRENDS

● As shown in Exhibit VII-3, respondents in our selected sample
anticipate sharp increases in:

- the number of systems in a communications environment

- the average disk memory capacity/system

- the average number of CRT stations/system.

● Despite the appearance of substantially more powerful hardware
systems in the marketplace, an increase in the price of the average
system is not anticipated.

2. DISTRIBUTED PROCESSING

● Five respondents forecast that the average percentage of their
shipments to be installed in a communications environment will increase
from 10% or less in 1976 to more than 25% in 1980 (Exhibit VII-4).

INPUT

EXHIBIT VII-3

OVERVIEW OF 1976-1980 PRODUCT AND PRICE TRENDS

AS REPORTED BY OUR SELECTED SAMPLE

AVERAGE FOR SYSTEMS SHIPPED	1976	1980	% CHANGES
Systems Operating in a Communications Environment	3%	30%	900%
Hardware Price	$55,000	$52,000	-5
Disk Drive Capacity System	25M Bytes	70M Bytes	180
Number of Visual Display/ Stations System	3	9	200

INPUT

EXHIBIT VII-4

ESTIMATED PERCENTAGE OF RESPONDENTS' SHIPMENTS

OPERATING IN A COMMUNICATIONS NETWORK ENVIRONMENT

% OF SHIPMENTS OPERATING IN A COMMUNICATIONS

NETWORK ENVIRONMENT

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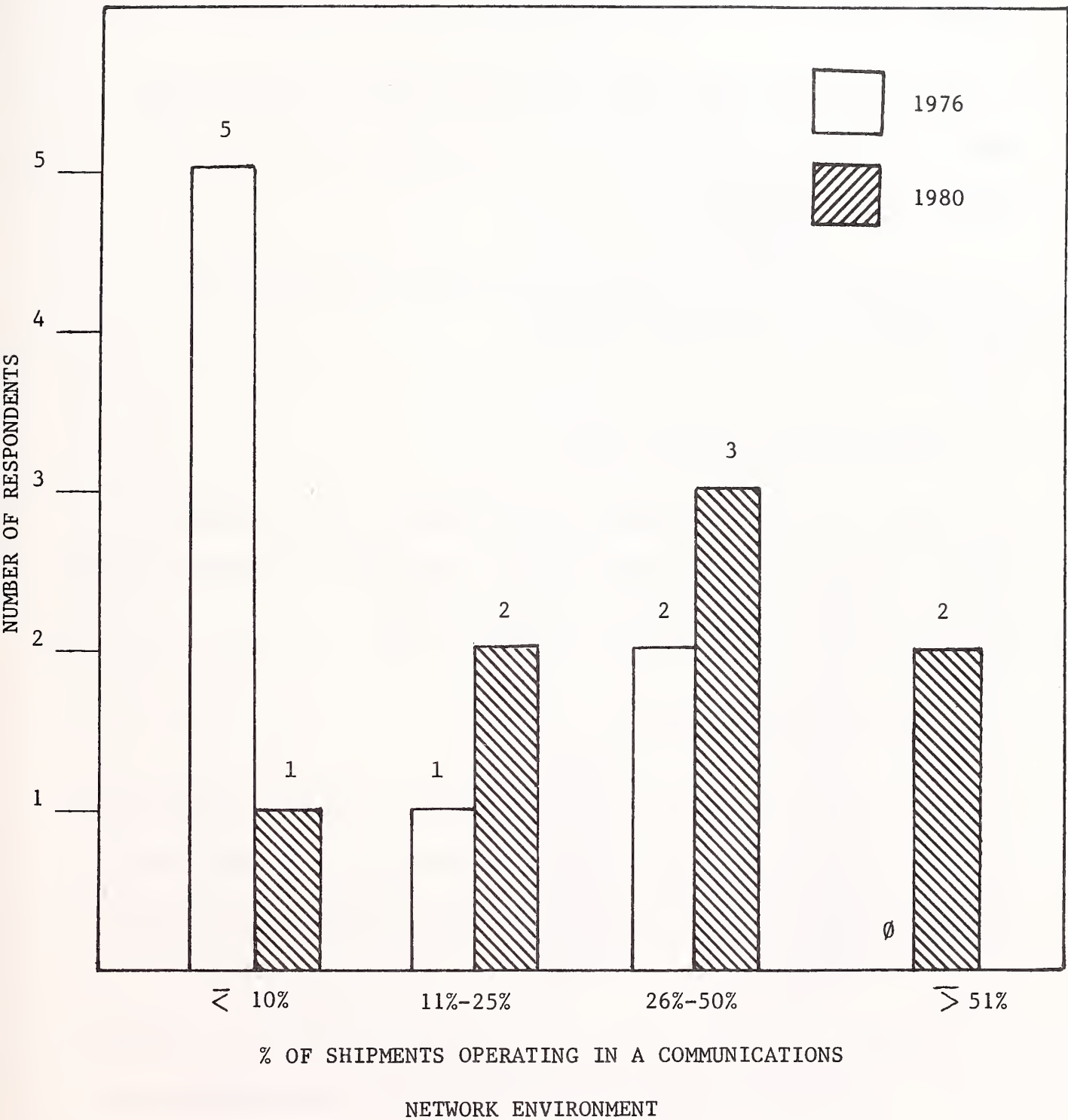
3. DISK MEMORY CAPACITY

●   Fifty percent of respondents forecast that disk memory capacity will expand from 10M or less in 1976 to more than 50M bytes in 1980 (Exhibit VII-5).

●   All respondents expect that disk memory capacity will at least double over the next 4 years in the average system supplied by their companies (Exhibit VII-6).

●   Fifty percent of the respondents anticipate at least a four-fold increase in disk memory capacity.

4. VISUAL DISPLAY STATIONS (CRTs)

●   Seven respondents forecast that the number of visual display stations (CRTs) per system will increase. Factors of estimated increase varying from 0% to 1000% with an average of 200%.

5. PRICE/PERFORMANCE TRENDS

●   The price of the average system is expected to remain essentially constant through 1980, despite steady improvements in product capacity and performance. This will result in a 1980 price/performance improvement of 1.6 over 1976.

●   The prime reasons for this price/performance improvement will be:
    –   Main memory components, semiconductors, and microprocessors continuing the trend of more capability for less cost resulting

EXHIBIT VII-5

ESTIMATED DISK MEMORY CAPACITY GROWTH PER
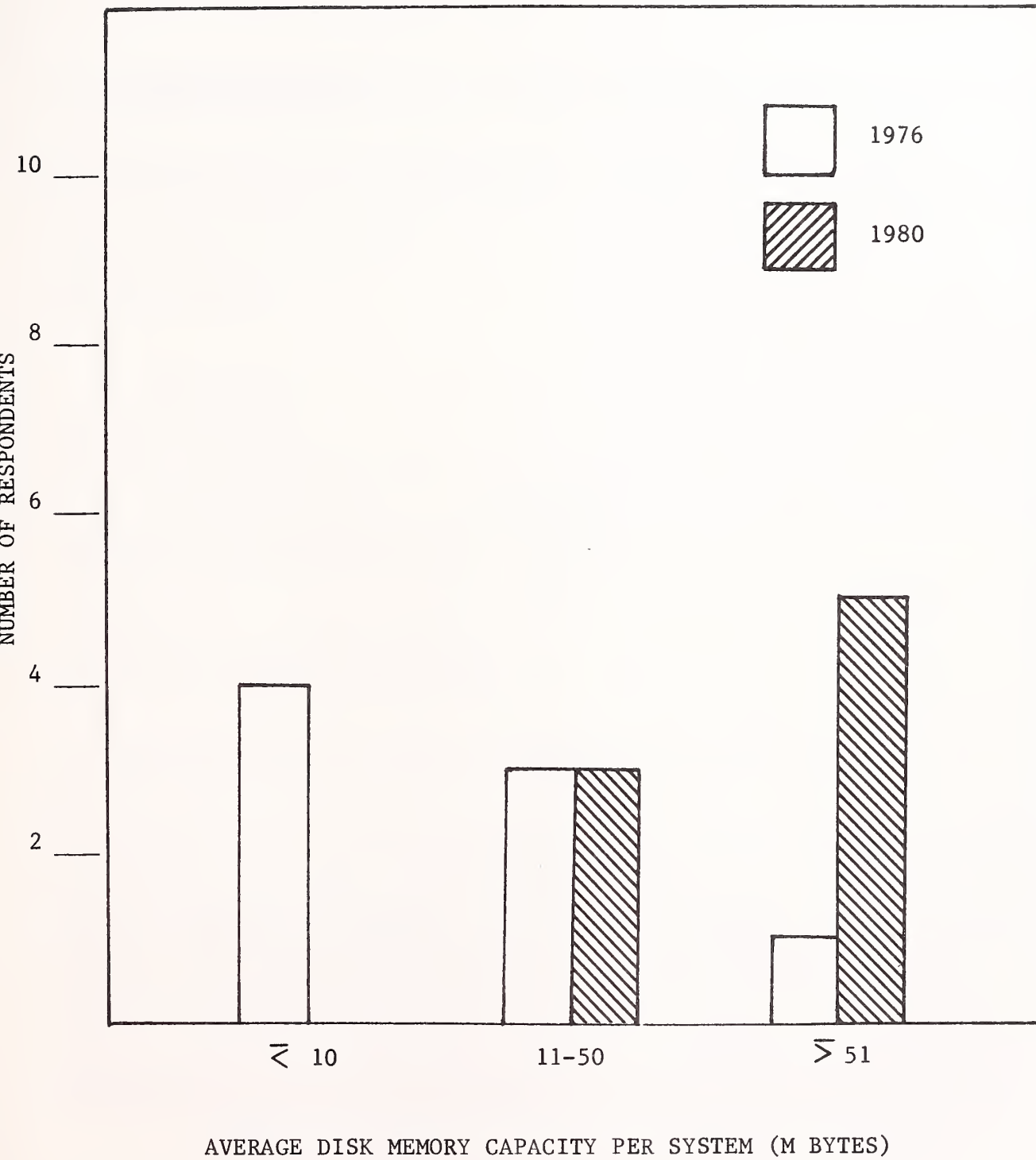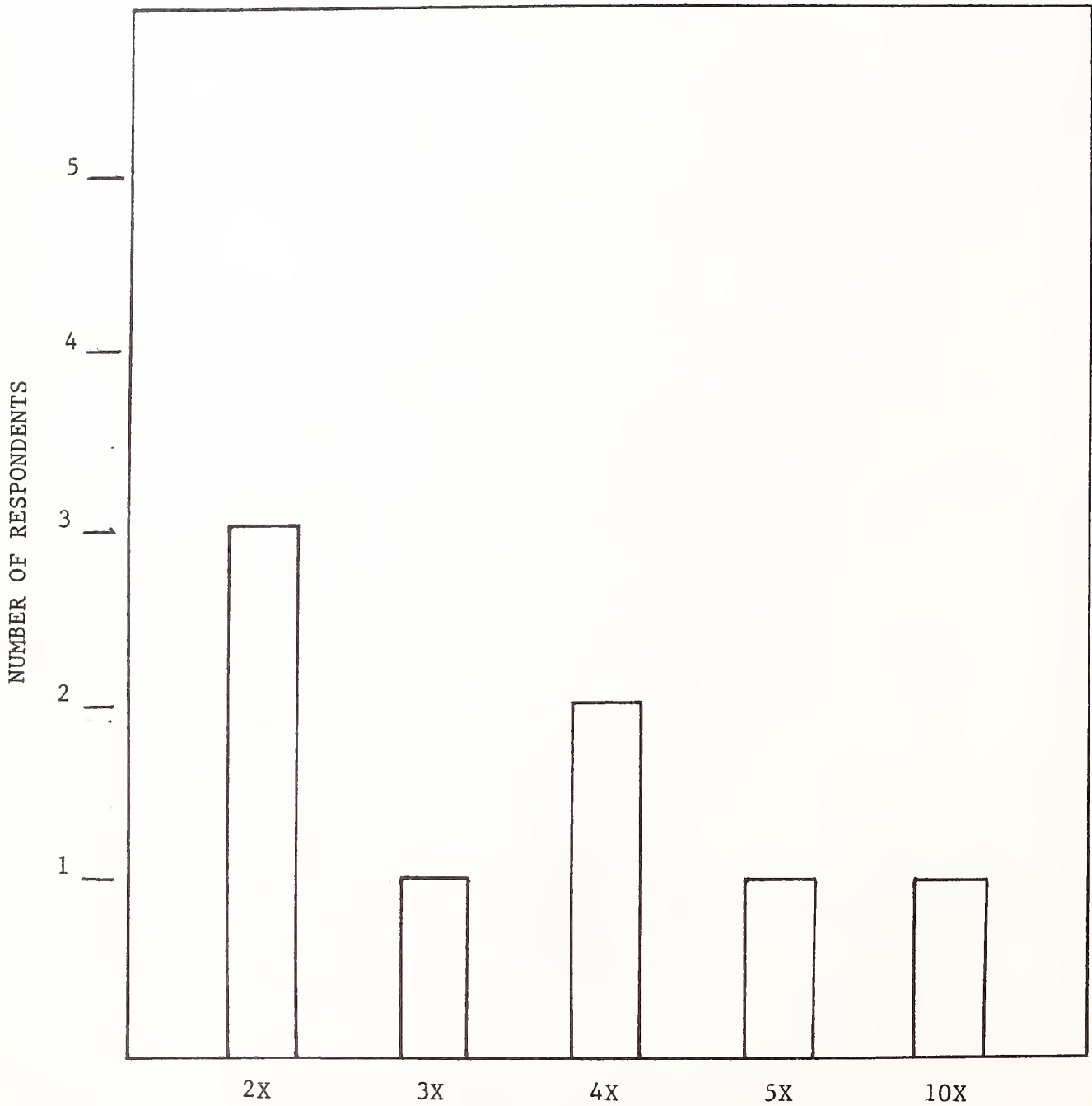
SMALL BUSINESS COMPUTER SYSTEM FROM 1976 TO 1980

AVERAGE DISK MEMORY CAPACITY PER SYSTEM (M BYTES)

INPUT

EXHIBIT VII-6

ESTIMATED DISK CAPACITY GROWTH

FROM 1976 TO 1980

AVERAGE SYSTEM DISK CAPACITY

IN 1980 AS A MULTIPLE OF 1976

INPUT

in decreased cost of manufacturing through higher production
volumes.

- Market growth and corporate considation through merger or
shake out

6. SYSTEMS SOFTWARE

● Improvements in the development of user-oriented software tools
will more effectively offset the constantly increasing hourly cost
for programming.

7. COMMUNICATIONS

● Communications will be utilized for distributed processing appli-
cations with increasing ease.

F. ANALYSIS OF THE MARKETPLACE

1. THE DISTRIBUTION INDUSTRY AS THE NUMBER ONE MARKET

● Fifty percent of the respondents report that the majority of their
installations are going into distribution companies. They anticipate
that distribution will still be the prime target in 1980 but that
some ground will be lost to manufacturing, insurance, and medical
applications.

INPUT

2. PRODUCT DISTRIBUTION TECHNIQUES

● Large manufacturing corporations (over $100M in sales) tend to market to the end user primarily through their own sales offices.

● Smaller manufacturers are striving to:

- Expand their distributor and agent networks

- Reduce the percentage of turnkey installations they perform

- Keep down their investment in applications support and packages.

3. THE PROCESSING SERVICES USER AS A TARGET

● Although individual manufacturers in our selected sample reported that 30% to 60% of new business came from defectors from processing services vendors, none stated that defectors were a designated target opportunity.

● Respondents pleaded ignorance of their field marketing strategies and indicated such activities were determined by sales district offices or by individual salesmen.

● All respondents anticipate that the trend of batch services users installing small business computers will accelerate.

● Processing services vendors offering the greatest product specialization will survive and prosper. "Generalists" will be most vulnerable to the price/performance improvements of the small business computer.

INPUT

- Processing services vendors can expect more intense competition during the next few years. They can defend their customer bases by pursuing one or more of the following strategies:

    - Provide more applications specialization

    - Improve responsiveness and service

    - Purchase small business computer on an OEM basis and market turnkey systems to augment their traditional services business.

INPUT

APPENDIX
USER QUESTIONNAIRES

SUBJECT: "Small Business Computers: Their Impact on Processing Services"

PROJECT CODE: MAS/MI

INPUT QUESTIONNAIRE: User of Small Business Computers

1. a) Have you replaced or considered replacing your outside data
        processsing service with an in-house mini or micro computer
        system(s)? _____

    b) Which one(s)?

        Vendor name _____

    c) Which small computer system manufacturers, or his representatives,
        called on you recently?

    d) Do you have a communications requirement? (protocols, line speeds,
        devices, etc.)

2. a) What is the reason for changing from an outside service?

    b) Who is your company's final decision maker? (name and title)

   c) How would you rank the following factors in analyzing the possibility of changing from a processing services vendor to an in-house mini or micro computer system? (1=unimportant, 10=critical)

Item	Ranking	Comment
Reliability of system	_____	
Applications programs available	_____	
Network availability	_____	
Compiler available	_____	
Assembler available	_____	
Operating system available	_____	
Offering of turnkey	_____	
Rentals (30 days)	_____	
Leases (1,2,3 years)	_____	
Cost per period comparison	_____	

   d) What experience has your company had in managing or operating computer installations?

3. In making a financial "in-favor-of" analysis for outside services versus an in-house computer system:

   a) What cost factors were considered and over what period of time? (i.e., conversion, training, lease, etc.)

   b) Were direct or fully absorbed costs used?

INPU

c) If there was operational satisfaction with outside service, what cost reduction would be necessary to favor an in-house system?

a) < 10%   d) 40-50%

b) 10-25%   e) > 50%

c) 25-40%

d) Has there been a post audit on any of the financial study forecasts?

_____ What were the results?

4. a) What in-house mini computer system do you now use?

(1) Manufacturer and model: _____

(2) Memory size: _____

(3) Peripherals: _____

(4) Software available: _____

b) What did you use previously? _____

5. What application(s) are you doing?

6. a) Is software done in-house?

b) If outside, with whom?

7. Experience with in-house system:

a) Hours available per day: Plan _____ Actual _____

b) % up time _____

c) Plans for system expansion:

d) People dedicated to the system:

| | Budget | |
	1976	1978
Operator	_____	_____
Programmer	_____	_____
Other	_____	_____

8. Who is the main "internal advocate" for the in-house system? (title)

9. Was the hardware manufacturer's proposal discussed with your outside
    computer services vendor?

    What were their comments?

10. Length of time required from:

    a) Concept to evaluation start: _____

    b) Evaluation start to decision: _____

    C) Decision to installation completion: _____

11. How is overall satisfication with users?

INPl

12. What suggestions or advice would you offer your (ex) computer services vendor so that he could more successfully combat the mini computer system onslaught?

13. Providing that he offered equivalent support, would you rent, lease, or purchase your mini or micro computer system from a computer services vendor rather than from the hardware manufacturer or his distributor?

   Why?

14. Would you be interested in having your computer system facility managed by a computer services vendor either at your, or at his location?

   Why?

15. May we please have a copy of your:

    a) Evaluation study

    b) Computer services proposal

    c) In-house system vendor proposal

    d) Internal cost analysis

16. Other comments?

INPUT

SUBJECT: "Small Business Computers: Their Impact on Processing Services"

PROJECT CODE: MAS-MI

INPUT QUESTIONNAIRE: Processing Services Vendor

1. a) Are you losing business to mini computer systems?

    b) What is the profile of the typical lost business account?

2. Why does your client consider an in-house mini computer system?

    a) Reasons given by users:

        (1)

(2)

(3)

b)   Reasons given by your salesmen:

(1)

(2)

(3)

c)   From your "Lost Business Report":

(1)

(2)

INPUT

(3)

(May we have a copy of the report?)

d) Rank the business lost to mini computer systems by billing level (1-5), and the percentage of the total loss these systems represent:

Monthly Billing	1976 (Actual)		1978 (Estimate)	
	Rank	%	Rank	%
Less than $1,000	____	____	____	____
$1,000 - $1,500	____	____	____	____
$1,500 - $2,000	____	____	____	____
$2,000 - $3,500	____	____	____	____
More than $3,500	____	____	____	____

e) How would you rank (1=unimportant, 10=critical) the user's reason for making change:

Reason	Rank	Comment
Cost:	____	
Control:	____	
Duration:	____	
Availability:	____	
Reliability:	____	
Other:	____	

f) What percentage cost reduction do you think is significant enough for the user to consider changing:

3. a) Using 1976 revenue as a base, what do you forecast for the future?

	Revenue		
	1976 (Actual)	1979 (Forecast)	1981 (Forecast)
Carry over of existing accounts:	_____	_____	_____
+New Business	_____	_____	_____
−*Lost Business	_____	_____	_____
=Annual Revenue:	_____ 100%	_____ 100%	_____ 100%

b) Of lost business reported as ___% of total in 3a*, how much do you believe is/will be lost to in-house mini computer systems?

	1976 (Actual)	1978 (Forecast)	1981 (Forecast)
Business lost to minis:	%	%	%
Other business loss, reasons	_____	_____	_____
*Total business loss	%	%	%

4. What is the corporate or data processing services revenues for fiscal year ending the month of _____:

    1976: $_____ Million (Actual)

    1978: $_____ Million (Estimate)

    1981: $_____ Million (Estimate)

5. a) How do you identify potential defectors?

INPU

b)   What are the names and addresses of 5 companies who defected in 1976?

(1)

(2)

(3)

(4)

(5)

6.   a)   What is your plan to meet this threat?

b)   May we have the names, addresses, and contact person of 5 of your
customers that we may call for a "user interview"?

(1)

(2)

(3)

(4)

INPUT

5)

7. Do you offer mini computer systems to your customers?

    a)   Free Standing   Yes _____   No _____   Plan to _____
    b)   Communications oriented   Yes _____   No _____   Plan to _____
    c)   Manufactured by whom?

    NOTE: If answer to 7a or 7b is "yes" please complete 8 through 17

8. Number of units installed _____, or when start _____

9. Do customers tie systems into your network?

10. What communications protocols, software interfaces, are provided or required?

11. What systems software is available for small computer systems?

12. a)   Applications available for small computer systems:

    b)   Is there an industry orientation for the small computer systems?

    c)   Do you provide turnkey installations? _____

    d)   Is marketing or operations in a separate organization from computer services?

    e)   Do you or would you offer facilities management for small computer system(s)?

    Please comment:

INPUT

13. What is the average revenue from clients using mini computer systems:

    a)   Hardware: _____

    b)   Other: _____

    c)   Total: _____

14. a)   Who performs maintenance of the equipment?

    b)   Comments:

15. Percentage of placements:

    Purchased or on full payment leases: _____

    3 year operating leases   _____

    2 year operating leases   _____

    1 year operating leases   _____

    Less than 1 year operating leases   _____
                                                             100%

16. What is the effect of offering small business sytems on service revenues?

17. What are the advantages/disadvantages:

    a)   Versus programmable hardware?

    b)   Versus Remote batch terminals?

18. How and why did you enter the business of marketing mini computer business systems?

INPU

SUBJECT: "Small Business Computers: Their Impact on Processing Services"

PROJECT CODE: MAS-MI

INPUT QUESTIONNAIRE: Marketer of Small Business Computers

1. Encircle: – Distributor   – Manufacturer   – Agent   – Other

2. a) If agent or distributor, who is the manufacturer of the system(s) you market?

    b) Please describe the hardware available and the number of peripherals (maximum, minimum, and average) per installed system:

ITEM	CAPACITY (min/max)	UNITS PER SYSTEM (max)
Memory	_____	_____
Visual Display	_____	_____
Printer(s)	_____	_____
Disc Drive	_____	_____
Tape Drives	_____	_____
Card Reader	_____	_____
Other	_____	_____

    c) What software is available?

    d)   What communications do you support (protocols, line speeds, devices, etc.)

    e)   What is the minimum \$_____K; maximum \$_____K; and

           average \$_____K price of your system?

3.   a)   Do you believe that replacing of outside computer services with an in-house mini computer business system is a viable market opportunity for you?

       Why?

    b)   Are you selling to this market?

    c)   How are you selling? (i.e., prospect identification, emphasis, strategies, "knock offs", etc.)

    d)   How would you split into groups what new customers formerly used?

       Manual System: _____

       Remote Computer Services: _____

       Batch Services: _____

       Large C.P.U.:   _____

       Other: _____

                                  100%

  e) How do the outside service companies or bureaus defend their
      customer base from this onslaught?

  f) What do you think will be the trend of capturing service bureau
      customers in 2-5 years?

4. What is your current machine population by units?

    Free Standing: _____

    Distributed Processing: _____
                                   100%

5. What percentage of unit placements is:

    Sold or on a full payout lease: _____

    On an operating lease (1,2,or 3 years):   _____
                                                   100%

6. Who does the customer's applications programming?

7. Who performs field maintenance on the equipment?

8. a) How many sales offices do you have, _____ and how are your
        salesmen compensated?

        Commission   _____

        Salary   _____

        Other   _____
                              100%

INPUT

b)   Average total compensation $_____/year

9.   Please provide the names and addresses of 3 or more new customers who
     have switched in 1976 from outside data processing services to your
     in-house computer system

        (1)

        (2)

        (3)

10. Are you planning to announce any new products shortly?   YES_____   NO_____
     (If yes, describe)

11. a)   What effect do you think the micro computer will have on your business?

     b)   What other technological advancements do you anticipate, and what will
          be the impact on the markets you serve?

INPUT

12.   In what percent of your placements do you supply customer
       installation support for the following activities?

       Is the price to the customer bundled or unbundled? (charged
       separately, or included in the cost of the system)

	%	(Check one Cost of Support)	
		Bundled	Unbundled
Communications Network Design:	____	____	____
Controller Peripheral Interface:	____	____	____
System Software Development:	____	____	____
Maintenance:	____	____	____
Operator Training:	____	____	____
Application Software Development	____	____	____
Other	____	____	____

13. What trends do you forecast with your product?

	1976	1978	1980
% of shipments having communications:	__ %	__ %	__ %
Value of average system ($1,000):	__ K	__ K	__ K
Average disk memory/system (MByte):	__ MB	__ MB	__ MB
Average number of visual display stations/system:	____	____	____
% of customer shipments:			
- Distributor industries:	____	____	____
- Manufacturing companies:	____	____	____
- Other prime category:	____	____	____

INPUT

14. For interviewees who manufacture as well as market the mini or micro computer system:

   a) Revenues $_____ for fiscal year ending _____1976.

   b) Number of employees _____

   c) Systems shipped domestically in 1976 _____, and _____% of total shipments.

   d) Key products and price:

<u>Hardware</u>   <u>Software</u>

   e) % of systems shipped to:

	1976	1978
End users:	____	____
Distributors:	____	____
Agents:	____	____
Others:	____	____
	100%	100%

   f) Number of units installed, 12/31/76: _____

INPUT